DOCUMENT RESUME

ED 076 188 JC 730 112

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TITLE Increasing Student Retention Through Application of Attitude Change Packages (and) Increasing GPA and Student Retention of Low Income Minority Community College Students Through Application of Nightengale Conant Change Packages; A Pilot STUDY.
PUB DATE 73
NOTE 17p.; Paper presented at California Association for Institutional Research, May, 1972

EDRS PRICE MF-$0.65 HC-$3.29
DESCRIPTORS Adults; *Autoinstructional Aids; *Changing Attitudes; *Independent Study; *Learning Motivation; Low Income Groups; Minority Groups; Post Secondary Education; *Self Concept; Tape Recordings; Technical Reports
IDENTIFIERS *Nightengale Conant Attitude Change Packages

ABSTRACT

The first of two studies reported was conducted to determine whether unemployed aerospace engineers who received computer science training as well as the Nightengale-Conant attitude change packages would have a significantly higher course completion rate than control classes who were given the same training without the attitude change packages. The experimental class totaled 30. They listened to the Nightengale-Conant tapes and were given class instruction concerning attitudes and goals. Findings showed that Ss benefitted from both the occupational training and the experience of learning to set personal goals and to change attitudes. The second study was conducted to determine whether the application of Nightengale-Conant attitude change packages to low-income, minority community college students would increase their grade point averages and retention rates. Ss were 24 low-income minority students who enrolled in Fall 1972 at San Jose City College and were awarded California Extended Opportunity Program grants in aid. Tapes were checked in and out by student supervisors; little, if any, effort was made to discuss with students ideas on the tapes. Results showed that the GPA and retention rates of these students were higher than the GPA and retention rates of the comparable control group. (KM)

INCREASING STUDENT RETENTION THROUGH APPLICATION OF ATTITUDE CHANGE PACKAGES

Submitted to:

CALIFORNIA ASSOCIATION
FOR
INSTITUTIONAL RESEARCH

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INCREASING STUDENT RETENTION THROUGH APPLICATION OF ATTITUDE CHANGE PACKAGES

STATEMENT OF PROBLEM

Recent statistics indicate that Santa Clara County, California has an unemployment rate of approximately seven percent. Among those who are unemployed is a rather unique group of unemployed workers, namely, the highly educated and trained aerospace worker.

The aerospace worker's predicament is particularly acute since in most cases he has enjoyed a high level of job responsibility, high income, and very temporary, if any at all, periods of unemployment. Additionally, some members of this group have been unemployed for up to twenty-four months.

From the point of view of this study, the problem was to provide educational assistance to enable some of these unemployed aerospace engineers to regain satisfying employment.

After a brief investigation with regard to the characteristics, interests, and attitudes of unemployed aerospace engineers, it became evident they seemed to share in common a loss of personal confidence, negative attitudes towards aerospace as a career, and a loss of goal-oriented behavior.

The rather ubiquitous existence of the above set of factors led to the rationale that to prepare these engineers for employment they would need to learn additional saleable skills. The decision to offer short term training in computer science was a natural because of the significant investment in the County in the computer industry. This decision was further supported by the idea that if the individual did not opt for a change of jobs into the computer

industry, the computer training would strengthen his qualifications as an engineer.

After a brief preliminary experience with a small group of unemployed engineers, it became evident that although computer training was a relevant skill, there seemed to be a lack of interest and a comparatively high drop out rate among trainees.

These observations lead to the hypothesis that perhaps the most important training component should be to instill in the trainee a whole new set of attitudes towards himself and his ability to seek and secure employment along with the skill of computer training.

The above thinking led to the formulation of the research question of this study; "Will unemployed engineers who receive training in computer science as well as attitudinal change packages have lower drop out rates at the termination of a course in computer science as compared to an equivalent group that receives only the computer training?"

REVIEW OF THE LITERATURE

Of the research done in the area of attitude change, perhaps one of the important generalizations that has come out of this is basically that, to change attitudes one way of doing it is to introduce new information bearing on attitudes (Peck 1955); enforce modification of behavior towards an object (Hovland et al. 1957) and to change personality (Krech et.al. 1962). In other words, if we can get a person to act positively and to react that way to other people we have, in effect, set up a reaction that triggers other people to react positively in response to this person. Hence a situation is provided which has high potential for not only really changing the person's behavior, but also of changing his basic attitudes in the way in which he

looks at life.

Before attempting to develop procedures for changing the attitudes of the trainees, an extensive search was made to determine if commercial attitude change packages could be purchased which were relevant to the task of changing attitudes of trainees in this study. It was found there were a number of attitude change packages which had been produced and used by industry. Of the packages that were reviewed, the one selected was by the Nightengale-Conant Corporation of Chicago, Illinois. Criteria for selection included: relevance to the group to be trained, relevance to community college teaching techniques and, finally, reasonableness of cost. Although this attitude change package was not expressly designed for use in a community college classroom, it, nevertheless, seemed reasonable to assume it could be used effectively in this context.

HYPOTHESIS

The following hypothesis was derived from the above review of literature and rationale; namely, unemployed aerospace engineers who receive computer science training as well as the Nightengale-Conant attitude change packages would have a significantly higher course completion rate ($P=.05$) as compared to control classes which were given the same training without the inclusion of the attitude change packages.

RESEARCH DESIGN

An effort was made to identify aerospace age engineers who had been unemployed for at least twelve to twenty-four months. This search led to the identification of approximately one hundred twenty of these engineers. The 120 were then divided at random into four classes of 30 each. One of the four classes was assigned at random as the experimental group and

the remaining three as control groups.

The experimental group differed from the control groups only in that the experimental group received the motivation package described above. The same course outline was used and strictly adhered to in each of the four.

Examination of the differences between the experimental group and each of the control groups revealed that besides the treatment effect, i.e., use of the attitude change package with the experimental group, some differences between the experimental group and each of the controls might be due to use of different teachers for each of the groups and the scheduling of classes at different times.

The first of these possible causes of variance--use of different teachers for the control and experimental classes--was controlled to a considerable degree through the course supervisor. The supervisor visited each of these instructors to insure the course was taught according to lesson plan.

The other possible source of variance between the experimental group and each of the control groups, that deriving from the scheduling time of classes was not deemed a serious threat to the internal validity of the experiment since the experimental group was scheduled at what was considered the least desirable time.

STATEMENT OF THE PROCEDURE

The procedure basically was that the classes met one meeting per week, for three hours each session and for six weeks. A total of 18 hours of instruction was presented to the classes. For clarification and identification, the classes were assigned the following Roman numerals; Class I, Class II,

Class III, Class IV. Class I through III were the control groups and met at the following times: Class I Friday evenings, 7:00 P.M. to 10:00 P.M.; Class II Saturday morning, 9:00 A.M. to 12:00 P.M.; Class III Saturday afternoon, 1:00 P.M. to 4:00 P.M. Group IV, the experimental group, met Saturday from 6:00 P.M. to 9:00 P.M.

In Classes I, II, and III instruction was started on time and followed the outline given. Class IV was conducted with personal greeting of each student, subordinant teaching to learning was used. That is, if the student didn't quite understand, the instructor took the attitude that he had not communicated effectively and tried other approaches until satisfying himself that the communication was understood.

Group IV instruction was given each meeting on attitude toward self, others, and on how to change attitude. Techniques were interjected directly into the instruction of the computer science program on goal setting, how to set goals, what effect they had on a person's life and how they can change a person's mode of life.

The Nightengale-Conant Corporation attitude change packages were used in strict accord to the manufacturers recommended instruction. This activity consisted basically of listening to tapes designed to assist listeners in goal setting and attitude change.

The fundamental idea of these tapes is that you improve performance through increasing motivation. If one assumes performance is a function of motivation multiplied by ability, it becomes apparent that

since ability is a relatively fixed variable increase in performance must come through increasing motivation, a variable which can vary widely. Hence, the basic rationale was to increase motivation through attitude change and, subsequently, increase class performance as measured by completion rate at the end of the computer class.

Upon completion of the unit of work, a Chi Square test of independence (Smith; 1970) was made between the experimental group and the control groups that received the highest completion rate. Basically, the hypothesis being tested was that there would be no significant difference between the experimental group on the variable of dropout as compared to a comparable control group. The logic of this statistical test is as follows: If the completion rate of the experimental class was significantly higher as compared to that of the control group with the highest completion rate, it would also be higher than each of the other control groups. Thus, the test would provide evidence for determining the efficacy of the use of attitude change packages and the overall rationale of this study.

FINDINGS

A student dropout was defined for purposes of this study as one who did not complete at least fifty percent of the class meetings, was absent for the last two class meetings, and hence, did not receive credit for the course. Using this definition, the dropout rates for each group follows:

Experimental Class	3 out of 32
Control Class I	12 out of 32
Control Class II	11 out of 32
Control Class III	11 out of 32

On the basis of the above, the test of the hypothesis was conducted between the experimental group and control Class II. (Either control class II and control Class III could have been used since there was a tie.)

TABLE I

Chi Square Test of Independence Between Experimental Group and Control Class II

	Experimental	Control	
Remained in Class	29 (25)	21 (25)	50
Dropped	3 (7)	11 (7)	14
	32	32	64

Chi Square = 5.84 d.f. 1 P is between .02 and .01

CONCLUSIONS AND IMPLICATIONS

The findings of this study support the hypothesis that unemployed aerospace engineers benefitted from the training of both a specific skill as well as the experience of learning to set personal goals and to change attitudes. Although the study has considerable heuristic implications, for example, it would be interesting to see if the treatment variable would generalize to other sub-populations of the community college, i.e., low income/minority students, adults over 21, drop out-prone students, caution should be exercised before concluding the treatment effect is widely generalizable. As a group, aerospace engineers tend to be highly trainable and capable of benefitting from instruction--characteristics not often associated with the other sub-populations above. Nevertheless, the results of this experiment provide

justification for using the treatment variable in further experimentation with other sub-sets of the community college and/or college/university populations.

Another aspect that the results of this study suggest for further exploration is the effect of the type of attitude change package. For instance, there are several other commercial attitude change packages available. Do they all work effectively, or are some better cost/benefit wise than others?

In conclusion, this study suggests some exciting possibilities for really improving instruction of, at least, selected populations of college-age students. It also suggests the need to experiment further with other populations not only of college age, but of high school as well. However, because of the financial costs involved and the lack of rigorous evidence on the question of what attitude change packages are effective with what kinds of groups, the decision to implement their use on a large scale must be tempered with caution.

INCREASING GPA AND STUDENT RETENTION OF LOW INCOME MINORITY COMMUNITY COLLEGE STUDENTS THROUGH APPLICATION OF NIGHTENGALE CONANT CHANGE PACKAGES - A PILOT STUDY

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Increasing GPA and Student Retention of Low Income Minority Community College Students Through Application of Nightengale Conant Change Packages - A Pilot Survey

PROBLEM

In a 1971 study entitled Increasing Student Retention Through Application of Attitude Change Packages by Paul P. Preising and Robert Frost, it was found that the dropout rate of unemployed aerospace engineers given Nightengale Conant attitude change packages and enrolled in computer science courses was significantly lower (P=.015) as compared to a comparable control group. This finding led to the research question of this study; namely, will the application of Nightengale Conant attitude change packages to low income minority community college students increase their grade point averages and retention rates in college?

RATIONALE AND HYPOTHESIS

The rationale for this study is basically detailed in the earlier study by Paul Preisirg and Robert Frost.[1] In brief the argument is that performance of the community college student is equal to ability multiplied by motivation. Of these two variables, ability is comparatively fixed; whereas, motivation varies from high to low. Consequently, to increase college performance efforts should be made to increase motivation in students. To illustrate the above point consider, for example, the performance of two professional football teams on any given Sunday. One team wins; the other looses. Quite often at a later date the role of winner and looser is reversed. If we ask why, the answer is quite obvious. Both teams are equally matched on ability, but motivation, i.e. "being up" for this game, varies from one Sunday to the next. Therefore, the team that wins is the team that is motivated or "up" for the game.

By analogy the same reasoning can be extended to the community college student. Those whose performance is measured by high GPA and retention rate are those who are motivated.

Among the most poorly motivated students at the community college are those who are low income/minority. Yet, this is no reason to assume that these students cannot be helped in overall performance through increasing their motivation. The purpose of this study is to test empirically whether or not the application of Nightengale Conant attitude change packages to an experimental group of low income minority students will help to increase their overall performance as measured by Fall semester increase in GPA and retention rates as compared to a comparable control group.

HYPOTHESES

Given the rationale outlined above, this study will test each of the following hypotheses:

1. The GPA of the experimental group (those given the Nightengale Conant attitude change packages) will be significantly higher (P=.05) as compared to a comparable control group.

1. Paul P. Preising and Robert Frost, Increasing Student Retention Through Application of Attitude Change Packages, paper delivered to California Association for Institutional Research, May, 1972.

2. The rate of college retention of the experimental group (those given the Nightengale Conant attitude change packages) will be significantly higher (P=.05) as compared to a comparable control group.

METHODOLOGY

Population and Sampling

The population for this study included ninety-two (92) low income minority students who enrolled in Fall 1972 at San Jose City College and were awarded California Extended Opportunity Program grants in aid on the basis of low income and high need for additional educational services. From this population of students, thirty (30) were selected at random, and at random thirty (30) were assigned to an experimental group. (Since the total number of students was so small, it was subsequently decided to use all of the students not in the experimental group as the control group (sixty-two (62) control group students)).

At the end of the Fall semester, six students selected to participate in the experiment refused to participate in the experiment; hence, the experimental group dropped to twenty four (24). Of the remaining students in the control group, there were thirteen (13) whose records were either lost, misplaced, or unable to be located. Hence, the control group at the end of the semester was dropped to fifty-five (55). Consequently, the tests of the hypotheses of this study were conducted on the basis of twenty-four (24) students in the experimental groups and fifty-five (55) in the control group.

EXPERIMENTAL TREATMENT AND PROCEDURES

Initially the attempt was made to assign each student one complete Nightengale Conant attitude change package and insure he listened to each of the tapes once each day devoting one week for each tape. Thus, for example, the student would listen to tape one once on Monday, Tuesday, Wednesday, Thursday, and Friday. Then he would listen for the second week of the experiment to tape two and so on until having listened to all of the tapes.

This procedure quickly broke down because of the lack of opportunity to supervise whether or not students actually listened to the tape and how frequently. As an alternative the tapes were collected and then issued out along with a cassette player by student supervisors who checked the tapes in and out and recorded the effort expended by the students in the experimental group who listened to the tapes. Little if any effort was made to meet with students and discuss the ideas presented in the tapes.

Meanwhile, the control group was advised they were in an experiment and were given some random counseling as a placebo. Thus, the chief difference between the experimental group and control group was that the experimental group listened to the tapes while the control group did not.

FINDINGS

The results of this study confirmed the hypotheses that the GPA and retention rates of low income minority students who received the Nightengale Conant attitude change package would be higher as compared to comparable control group. (See Tables I and II for additional details.)

*TABLE I

t - Test for Significance of a Difference Between the GPA Means of Experimental and Control Groups of Independent Samples of Unequal Size

DATA:

Experimental - GPA $\bar{X} = 2.02$, $n_E = 24$, $SD_E =$ $Ex_E^2 = 38.42$

Control = GPA $\bar{Y} = 1.07$, $n_C = 55$, $SD_C =$ $Ex_C^2 = 101.70$

FORMULA:

$$S_{(\bar{X}_E - \bar{Y}_C)} = \sqrt{S^2 \left(\frac{n_1 + n_2}{n_1 \times n_2}\right)} = \left(\frac{1.82}{1}\right)\left(\frac{24+55}{1320}\right) = .33$$

$$S^2 = \left(\frac{Ex_E^2 + Ex_C^2}{n_E + n_C - 2}\right) = \frac{38.42 + 101.70}{24 + 55 - 2} = 1.8197$$

$$t = \frac{\bar{X}_E - \bar{Y}_C}{S_{(\bar{X}_E - \bar{Y}_C)}} = \frac{2.02 - 1.07}{.33} = \frac{.95}{.33} = 2.88$$

t with 77 df is significant at $P < .005$

*Statistics calculated according to G. Milton Smith, A Simplified Guide to Statistics for Psychology and Education, Holt Rinehard and Winston, Inc., 1970, page 82.

*TABLE II

Chi Square Test of Independence Between
Retention Rates of Experimental and Control Groups

	Experimental	Control	
Remained in Class	20	24	44
Dropped	4	31	35
	24	55	79

Chi Square = $\frac{n\,(ad-bc)^2}{(a+b)\,(c+d)\,(a+c)\,(b+d)}$

Chi Square = $\frac{79\,(20\times31-24\times4)^2}{(44)\,(35)\,(24)\,(55)} = 10.67$

Chi Square = 10.67, d.f = 1, $P < .01$

*For calculations of Chi Square test of Independence see, G. Milton Smith, op.cit., page 193.

DISCUSSION

The results of the study quite dramatically support the effectiveness of the Nightengale Conant attitude change packages. However, it should be noted that tight controls of the experimental treatment were not always possible to enforce. For example, some of the experimental groups listened faithfully, whereas, others listened erratically. This raises the issue of how much was their performance a matter of the Nightengale Conant tapes, on the one hand, or self selection on the other. It should be recalled that six (6) of the experimental groups refused to participate in the experiment. Their common complaint was they did not have time to do so. Hence, very possibly six of the weakest participants may have been excluded from the study. Nevertheless, however, even if all six of these students had dropped out of college, the retention rate of the experimental group still would have compared favorably to that of the control group.

Further, it was noted some low income minority students are so totally unmotivated that they operate somewhat like to horse who not only refuses to drink, but will not even go over to the water. Said another way, if the patient refuses the innoculation, there is no way the medicine in the innoculation can help him. Thus, one of the problems identified is how do you deal with the zero motivated student? Related to this was a second observation; namely, the student who benefited from the tapes was one who was already somewhat motivated. Hence, one idea for listening is to motivate the motivated student and then get them to work with the zero motivated student as a peer counselor and/or tutor.

RECOMMENDATIONS FOR IMPROVED TESTING

The difficulities experienced in this pilot test suggest the following recommendations:

1. Students in the experimental group should be required to listen to the tapes as set out in the experiment as part of their responsibility for being granted an award of financial aid.

2. One way to get the zero motivated student to benefit from the tapes is to first of all motivate his peer counselors and tutors by using the Nightengale Conant tapes to motivate the motivators, and then hope their motivation will have a "spill over" effect on the zero motivated student.

3. A field test of the Nightengale Conant attitude change packages should be conducted at selected pacesetter community colleges within the state of California. This testing should capitalize on the experience of this pilot study to avoid errors and insure utmost rigor. The results of such a field test should then be shared widely. If these results are positive, the use of the Nightengale Conant attitude change packages or similar materials should at best be required to be included as components of low income minority programs or at least strongly recommended as such by those responsible for allocating such funds.

CONCLUSION

This pilot study revealed some difficulties of using attitude change packages to motivate low income minority students. Nevertheless, the results of the study suggest the Nightengale Conant attitude change packages can be of considerable help in increasing the grade point averages and retention rates of low income minority students.

The experiment did not identify any serious reason for not continuing to experiment and test commercial attitude change packages such as those of Nightengale Conant in educational settings. From a researcher's point of view, experimentation by using attitude change packages is both feasible and practical. The heuristic value of such experimentation as well as its significance for improving learning is definitely high.